

REMARKS

The independent claims 20 and 33 stand rejected under 35 USC 102 over each of Hochsmann et al. and Monsheimer et al. The rejections of the dependent claims depend on the rejections of the independent claims 20 and 33. Applicant respectfully requests that the examiner should reconsider and withdraw the rejections of the independent claims.

Applicant wishes to thank the examiner for the courtesy extended to the undersigned representative during the telephone interview that took place on October 16, 2009. During the interview, the representative suggested that Hochsmann et al. does not disclose sintering. The examiner drew attention to the references to sintering in column 1 of Hochsmann et al. and suggested that Hochsmann et al., taken as a whole, discloses, or at least suggests, sintering. Applicant's representative suggested that Monsheimer et al is not available as prior art against this application under 35 USC 102(e). There was no discussion of possible amendment of the claims.

The subject matter disclosed in this application is concerned with a method of selectively sintering particulate material. As set forth in both claim 20 and claim 33, the method comprises providing a layer of particulate material and varying the absorption of radiation across a selected surface portion of the layer to sinter a portion of the material of the layer by providing (or depositing) an amount of radiation absorbent material over the selected surface portion of the layer of particulate material.

In an embodiment of the claimed subject matter, the radiation absorbent material absorbs more energy than the non-treated material (i.e. the underlying particulate material). By absorbing more energy, the particles in the treated areas receive more energy than the particles in the non-treated areas (i.e. they get hotter where printing of radiation absorbing material has occurred). In applicant's high speed sintering method, it is necessary that the particles in the treated area achieve a higher energy level (i.e. temperature) than the particles in the non treated areas otherwise either consolidation does not occur or all particles present will consolidate.

Hochsmann et al. discloses a method for manufacturing a three-dimensional object in which a moderating agent is applied to a selected area of a layer of a pourable composite material containing particles within a binder material coating. The moderating agent melts the binder material, or causes it to chemically react, thereby altering the level of specific energy needed to bond the composite material together. See column 2, line 22-30. Thus, Hochsmann et al. teaches use of melting to cause the pourable composite material to coalesce.

The moderating agent in Hochsmann et al. works by reducing the energy level required in particles in order for a given volume of material to consolidate. In Hochsmann et al., particles in areas that are treated with the moderating agent reach logically the same level of energy as those in non treated areas (e.g. they achieve the same temperature) – however the moderating agent means that the particles in the treated area consolidate but those in the not-treated area do not. The moderating agent will absorb some energy although it is not necessary for the moderating agent to absorb more (or less) energy than the non-treated material in order for consolidation to occur.

The verb “to sinter” means “to cause a powdered material to coalesce by heating (and usually also by compression), without melting.” Thus, sintering has two characteristics, namely that the powdered material coalesces, and that the material does not melt. Since sintering requires that the material does not melt, it follows that Hochsmann et al. does not disclose sintering. Therefore, Hochsmann does not anticipate the subject matter of claims 20 and 33. Since the rejections of the dependent claims 37-48 over Hochsmann et al. depend on the rejection of claim 20, it follows that the dependent claims are not open to rejection relying on Hochsmann et al.

Whether Hochsmann et al. suggests that the method disclosed starting at column 2, line 20 might be performed by sintering is not relevant to the issue of patentability of claims 20 and 33 over Hochsmann et al., as currently presented by the examiner. Thus, the

current rejection is under 35 USC 102, which requires that every feature of the claim be identically disclosed or described in a single reference.

The moderating agent of Hochsmann et al. is not an apt counterpart for the radiation absorbent material recited in the claims. Specifically, claim 33 recites:

varying the absorption of provided radiation across a selected surface portion of the layer to sinter a portion of the material of the layer... wherein the variation of radiation absorption...is obtained by providing an amount of radiation absorbent material over the selected surface portion.

From the quoted wording of claim 33 it is clear that the ability to cause sintering is inherent to the radiation absorbent material. As mentioned on the first paragraph of page 8:

radiation provided by the radiation source 12 is absorbed by the radiation absorbent material 50...causing the radiation absorbent material 50 to heat up. Heat from the radiation absorbent material is radiated to the underlying particulate material raising the temperature of individual particles of the particulate material. As the particles are heated to a temperature approaching their melting temperature, they neck and coalesce with adjacent heated particles. As the temperature subsequently decreases, the particles form a coherent mass of combined particulate material.

The moderating agent is not analogous to the radiation absorbent material because it does not (and cannot) cause sintering of material and is only provided to change the energy required to melt the binder material. Hochsmann et al. does not disclose or suggest that the moderating agent absorbs radiation and then re-radiates the radiation to the particulate material to cause sintering.

The earliest possible date at which Monsheimer et al. is available as prior art under 35 USC 102(e) is its filing date of March 15, 2004. Applicant claims priority of a British patent application filed on July 25, 2003. A certified copy of the priority application has been filed, and applicant submits that the subject matter of the claims is disclosed in the British patent application in the manner required by 35 USC 112, first paragraph. Applicant therefore submits that the claims are entitled to the priority date of July 25, 2003, and that Monsheimer et al. is not available as a reference against this application under 35 USC 102(e).

Respectfully submitted,

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